

# BEST PRACTICES IN ACCELERATING THE DEPLOYMENT OF DISTRICT ENERGY



## DISTRICT ENERGY IN CITIES

A GLOBAL INITIATIVE TO UNLOCK THE POTENTIAL OF ENERGY EFFICIENCY AND RENEWABLE ENERGY



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# DISTRICT ENERGY IN CITIES INITIATIVE LAUNCH AT CLIMATE SUMMIT



DISTRICT ENERGY  
IN CITIES  
INITIATIVE



Sustainable Energy for All  
(SE4All) Sub-Committee's



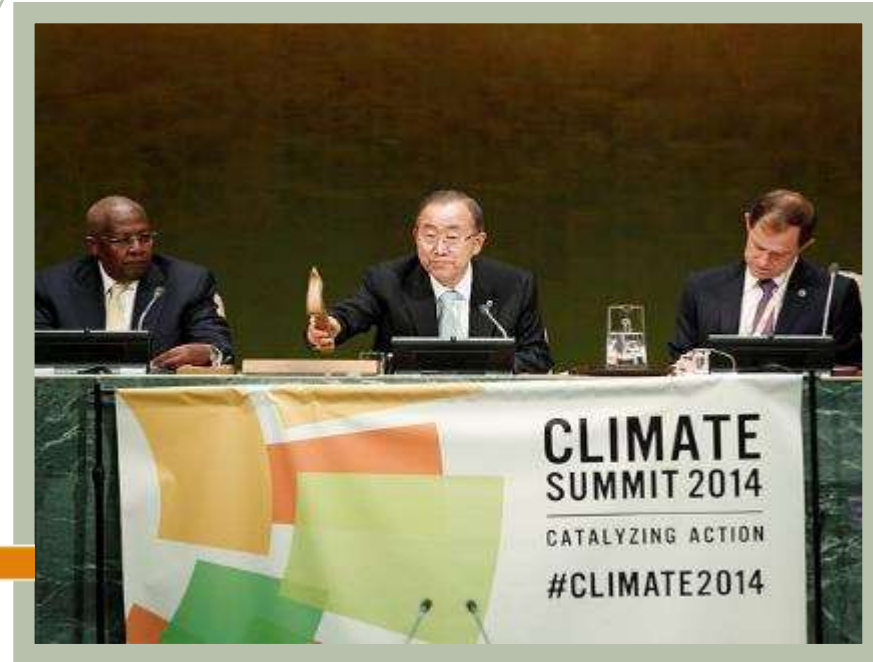
#### Co-chairs:

- UNEP Executive Director
- CEO Accenture
- Minister for Trade and Development Cooperation, Denmark

Global Energy Efficiency Accelerator Platform; to scale up efficiency gains and investments at the national, sub-national and city levels through technical assistance, support and public-private sector collaboration

Individual accelerators focus on specific energy efficiency sectors

- Buildings
- Transport
- **DISTRICT ENERGY**
- Lighting
- Appliances & Equipment



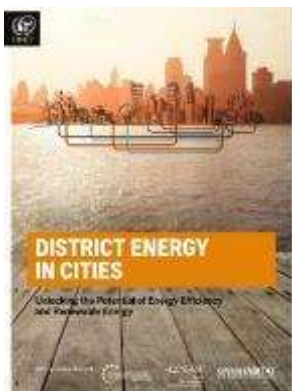
Our donors:



Double Global Rate of Improvement of Energy Efficiency by 2030



# OUR APPROACH: TAKE BEST PRACTICES, ADAPT AND REPLICATE



- 45 Champion Cities
- Technology and benefits
- City policies
- Business models
- National policies



## Methodology and Key Steps

1. **Assess** existing energy and climate policy objectives, strategies and targets and identify catalysts.
2. **Strengthen** or develop the institutional multi-stakeholder coordination framework
3. **Integrate** district energy into national and/or local energy strategy and planning
4. **Map** local energy demand and evaluate local energy resources
5. Determine relevant **policy design** considerations
6. Carry out **project pre-feasibility** and viability
7. Develop **business plan**
8. Analyse **procurement options**
9. Facilitate **finance**
10. **Replicate**



# WHAT DO WE DO?

## Our goal:

Helping cities tackle the energy transition through district energy

## Our model:

A private-public partnership with over 40 partners

## What we do:

MARKET TRANSFORMATION



1. Increase **knowledge** of multiple benefits of district energy
2. Provide **technical assistance** to identify potential pilot projects, undertake pre-feasibility studies, design business models, support the tender process and develop long-term local district energy strategies.
3. **Scale-up** locally through the establishment of local multi-stakeholder coordination units and nationally through a National Delivery Unit and the development of a regulatory framework.
4. **Unlock investments:** Design financial mechanisms to address financial barriers and support the first projects in new markets.





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# WHERE ARE WE?



14 COUNTRIES  
25 CITIES





## INVESTMENT

\$ 26.5 M leveraged in-kind and cash investment, including \$21M in project financing...so far!

\$3.4 M direct investment, including Global Environmental Facility, Danish International Development Agency, Italian Ministry of Environment and Danfoss Foundation



## PARTNERS AND CITIES

43 Partners  
14 Countries  
25 learning cities  
11 champion cities



## DISTRICT ENERGY IN THE COUNTRIES AGENDA

- District cooling under Indian National Cooling Action Plan
- District heating in the Chilean National Decontamination Plan
- District heating in the new Presidential Plan of Chile
- Belgrade selects the Initiative to co-develop its DH Action Plan to unlock €380 million of investment





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# THE INITIATIVE IN ACTION

UN   
environment

ASIA





# INDIA: DRIVERS AND BARRIERS

## DRIVERS

- Exponential growth in building energy consumption mainly due to space cooling demand.
- Most of this energy will come from grid-based electricity ( mainly coal power).
- Increasing stress on electricity grid. Utilities struggle to meet summer peak demand
- Low-cost and sustainable solutions required



## BARRIERS

- Lack of awareness among building owners, national and local governments, utilities.
- Lack of data, no track of cooling demand, lack of operation costs.
- Very fast real state developers. DC operators need to be faster to get earlier in the planning process.
- No centralized cooling in public buildings.





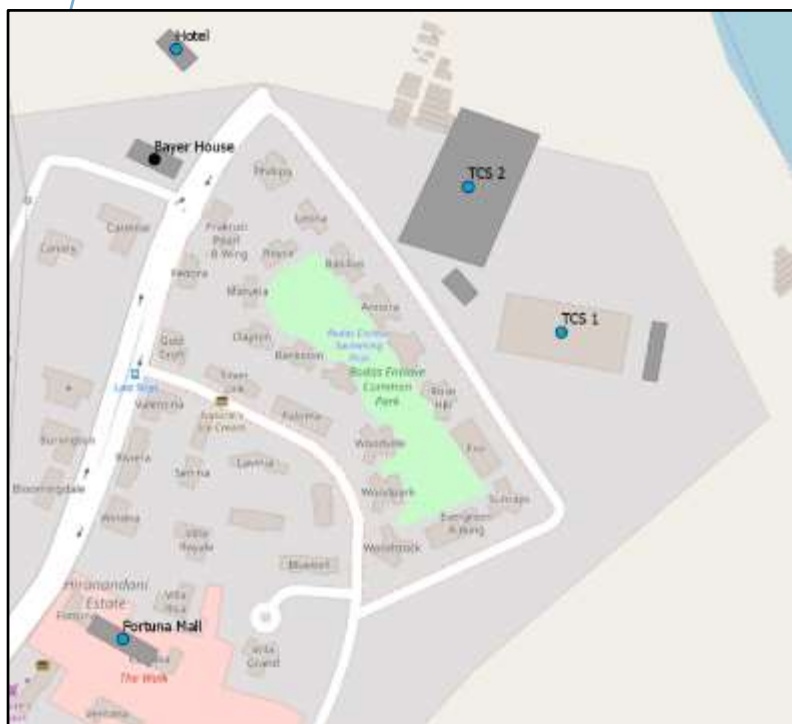


- **Awareness raising:**
  - ✓ Four workshops building local stakeholder engagement
  - ✓ FAQs document published for local stakeholders
- **Technical support:**
  - ✓ Rapid assessment reports on 5 cities published ( identification of barriers and potential for DC in each city)
  - ✓ Two project pre-feasibility studies ongoing
- **Capacity building:**
  - ✓ Stakeholder coordination training





## HIRANANDANI ESTATE PROJECT (GREENFIELD)



- Will connect two large IT office buildings from Tata Consulting Services with data centers
- Approximately 10,000 TR for phase 1
- Other local consumers being considered and more large buildings in planning
- Electric chillers and trigeneration most likely technologies
- Prefeasibility study to finish in two months
- **Risks:**
  - Need to agree on DCS system before TCS(Tata Consulting Services) 2 construction of plant room.
  - TCS 1 already operating own system
  - Very fast real estate construction



## VIVIANA MALL AREA PROJECT (BROWNFIELD)



- Eight different building owners highly engaged (malls, offices, hospital, data center)
- Proposed phase 1 will be 10-20,000 TR with 2km of network (still confirming optimal phase 1 connections)
- Electric chillers and trigeneration most likely technologies
- Prefeasibility study to finish in two months





# INDIA: RESULTS AND NEXT STEPS

## INITIAL RESULTS

- District cooling has been included under the National Cooling Action Plan
- GEF-7 country programme on district cooling , including the establishment of a national fund to support the development of district cooling projects
- Thane commits to deliver district cooling pilots
- EESL incorporated district cooling within its investment targets
- Preferred business model Public-Private partnership



## NEXT STEPS

- Trainings, tools and methodologies developed in India will be made available through our virtual platform.
- A national study on DC in collaboration with EESL
- 10-year city plan for district energy in Thane
- Demonstration project (design, business model, tendering)
- New local policies



**One of the most active district cooling markets in South East Asia**

### DRIVERS:

- Very fast real-state market growth
- Nearly 60% of energy use in high-rises comes from air-conditions.
- Achieve its Paris Agreement pledge: reduce GHG emissions 45% by 2030 and comply with Kigali Amendment of Montreal Protocol.

### BARRIERS

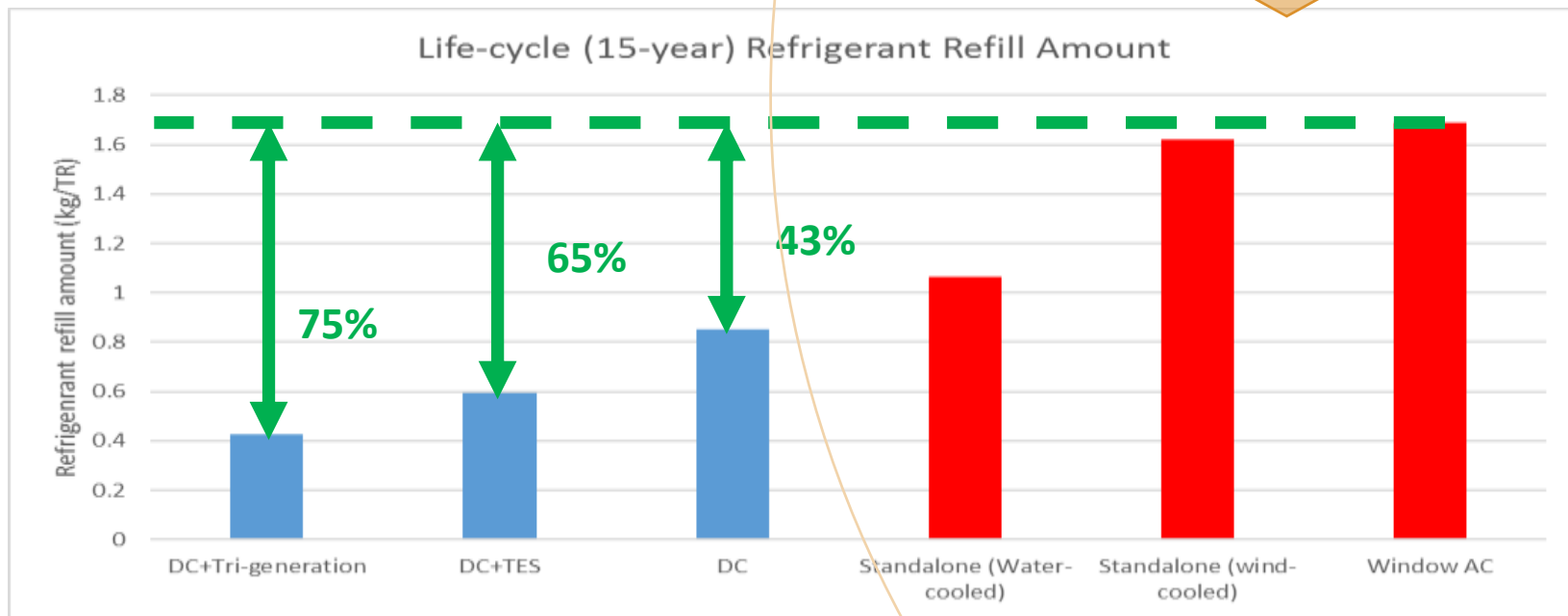
- Lack of a regulatory framework: No guidance and requirements for cities to integrate District Cooling into the cities' infrastructure planning and construction.
- The lack of the standardization or benchmark across the District Cooling industry.
- The lack of the demonstrations where district cooling connect the large sustainable sources, such as local renewables, waste energy and tri-generation etc.,.





Including: barrier analysis, technical assessment, identification of regulatory gaps and development of initial strategies to unlock full potential of district cooling in Iskandar.

DC with tri-generation and/or thermal energy storage (TES) can also contribute to the refrigerant phasing out in a life-cycle period (15 years)!. ( Kigali Amendment)







- Analysis of two potential pilot projects ( Medini and Sedenak data hub) including environmental benefits, contribution to phasing out refrigerants and GHG emissions. The study is on-going.

### New Development:

Sedenak Iskandar Data Hub



### Existing Development:

Medini



- Save 30% of electricity, 25% of water annually
- Save over 35% of CO2 emission annually
- Save over 25% of refrigerant refill in the life cycle of 20 years

Tri-generation+electric chiller+TES)



# MALAYSIA

## NEXT STEPS

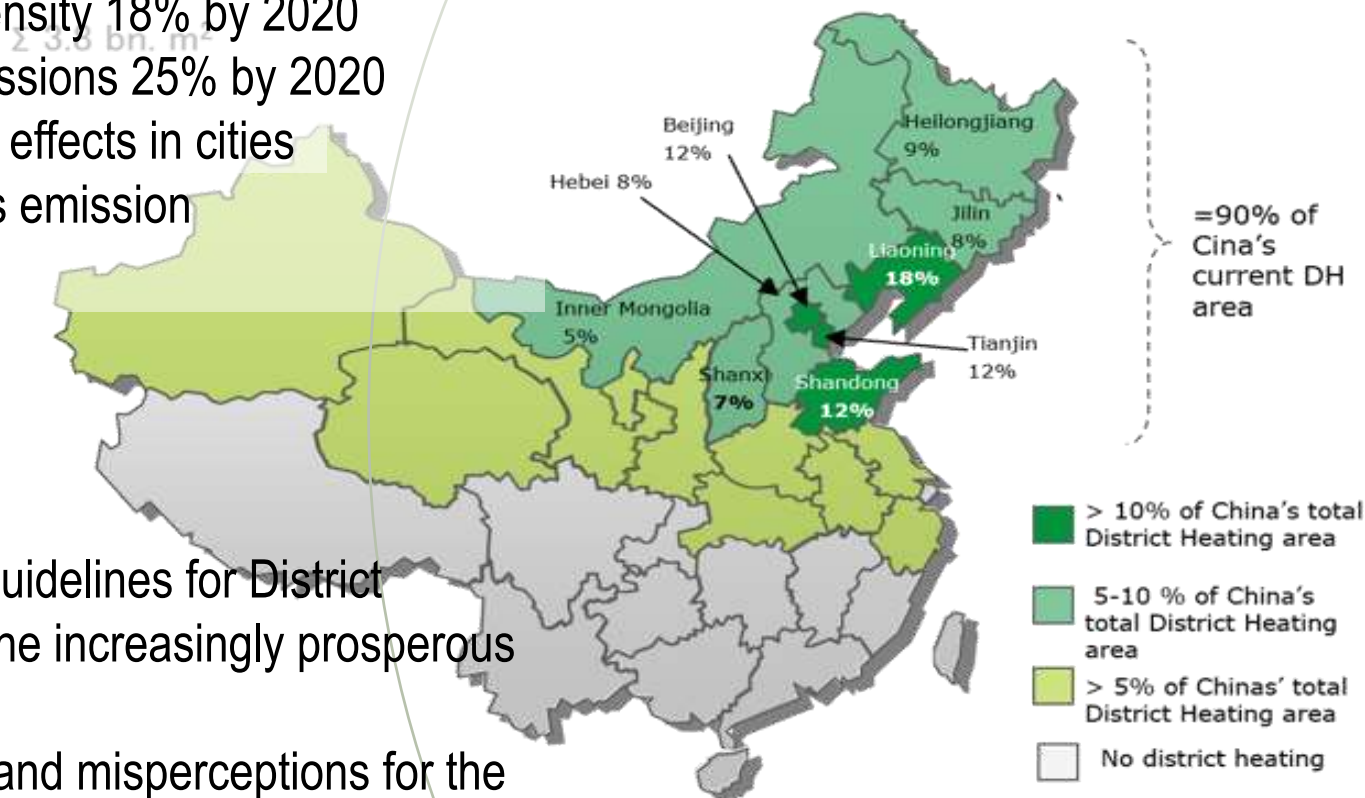
- Prepare a general framework on district cooling to be incorporated into the Structure Plan for Johor State
- Co-develop planning guidelines on district cooling for Iskandar Region, to be scaled-up nationally
- Establish a taskforce of Initiative partners to provide advisory services to the region
- Build a global task force on the viability of connecting data centers to district energy.
- Explore international funding opportunities to finance and support DC studies, energy master planning and policy development.





### DRIVERS:

- Reduce energy intensity 15% by 2020
- Reduce carbon intensity 18% by 2020
- Reduce PM2.5 emissions 25% by 2020
- Reduce heat island effects in cities
- Reduce refrigerants emission



### BARRIERS

- Lack of policies or guidelines for District Cooling to support the increasingly prosperous market
- Lack of awareness and misperceptions for the modern District Energy system
- Lack of data on heating and cooling consumption in cities.





- **Engaging the national authorities:**

- ✓ Partner with China Energy Conservation and Environmental Protection Group and the National Development and Reform Commission.

- **Technical support:**

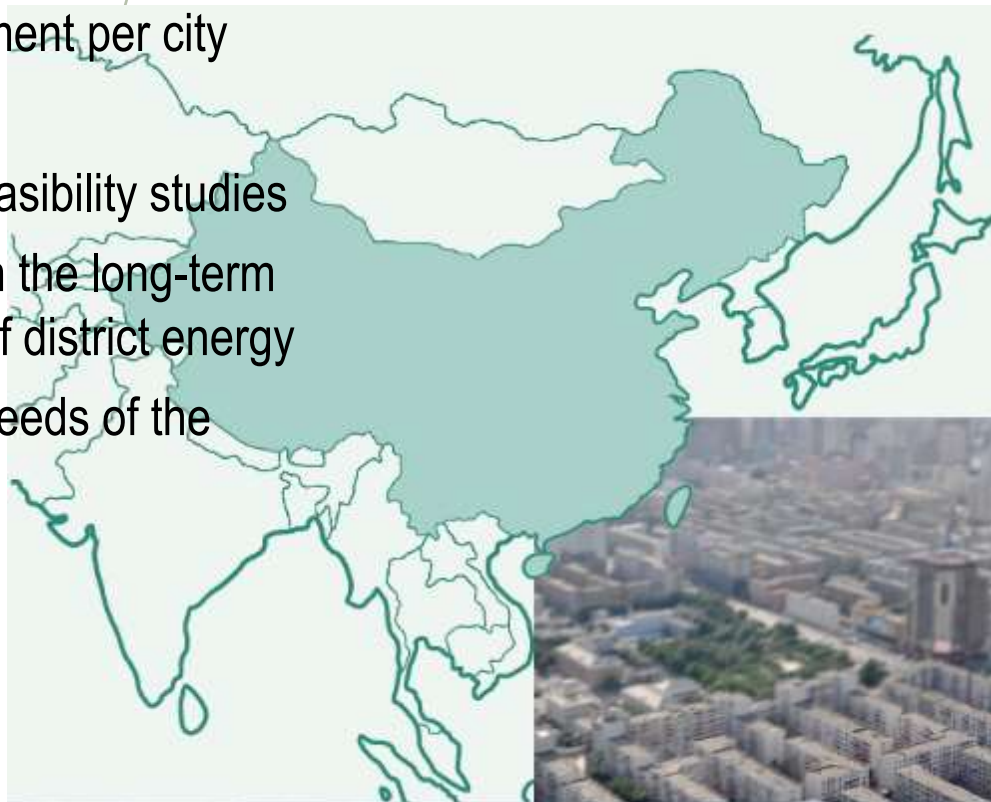
- ✓ Establishment of a virtual center for district energy technical research and engineering applications in collaboration with South China University of Technology.
- ✓ Development of some case studies on district cooling project in the cities of Zhuhai, Zhengzhou and Qianhai





## NEXT STEPS

- Call for city selection: 3 to 6 pilot cities for district cooling and district heating
- Development of one rapid assessment per city
- Selection of a deep-dive city
- Development of at least two pre-feasibility studies
- Development of a city wide plan on the long-term technical and economic potential of district energy
- Training sessions adapted to the needs of the pilot city





- ✓ **Strengthen engagement with Initiative's partners present in Asia-Pacific region**

- ✓ **Develop tailored tools for the region:**

- ✓ **ASEAN( (Association of South-East Asian Nations):**

- ✓ **Kigali Cooling Efficiency Programme:**

- ✓ **Mongolia:**



Develop a assessment tools tailored to the region, benchmarks for DC, promote best practices based on lessons learnt in the region

Preparing a concept for a regional commitment to DC

Concept proposal under preparation. Looking for countries, cities which might need support and partners to collaborate with us.

Support the preparatory phase of a GCF proposal to scale-up the use of energy efficient district e energy to improve air quality





For more information on the District Energy in Cities Initiative and to become a partner, please visit the website or contact:

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